МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
НАЦІОНАЛЬНИЙ ТЕХНІЧНИЙ УНІВЕРСИТЕТ
«ХАРКІВСЬКИЙ ПОЛІТЕХНІЧНИЙ ІНСТИТУТ»

МЕТОДИЧНІ ВКАЗІВКИ

до виконання самостійної роботи
«Контрольні запитання з лекційного матеріалу для виміру якості навчання»
з курсу «Безпека життєдіяльності»
для студентів, що вивчають предмет на іноземній мові

METHODICAL INSTRUCTIONS

for independent work
«Control questions on the lecture material to determine the quality of learning »
on the course « Safety of living»
for students who are studying the subject in English

Харків 2018

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INTRODUCTION

«Safety of living» is discipline of the humanitarian-technical direction, which summarizes the data of the relevant scientific-practical activity. The discipline «Safety of living» forms conceptual-categorical, theoretical and methodological tool, which is necessary for the learning of the specific hazards and methods of the protection from their.

Questions of the lecture material of the subject «Safety of living» for students knowledge self-control, obtained on the lectures, are drived at the methodical indications. Also, the answers on the proposed questions are drived in chaotic order. Its necessary that to invoke of the students thinking about correct answers, answering to the questions.

1 QUESTIONS

Lecture 1

1. What are the biggest chemical accidents in the history of mankind?

2. What are the main points of The Health and Safety at Work etc. Act (HSWA) 1974?

3. What are the general duties of employers to employees and employers and self-employed to persons other than their employees?

4. What is the main idea of health-related safety in the home and community?

5. What are the main Health and Safety Interventions?

Lecture 2

1. What is the manufactured risk? Examples of manufactured risk

2. What are the main simple definitions of risk?

3. What are the categories of risk classification?

4. What are the types of moral hazard?

5. What are the limitations of insurance and market failure in insurance?

Lecture 3

1. What is the history of «man-environment» interaction?

2. Are man and environment the same?

3. Why do we have such an awkward situation despite vast investments in research? Why is the understanding of human behavior so difficult?

4. How far is the explanation of behavior possible with the two system assumption?

5. What are the main elements of Ingar program?

Lecture 4

1. What is the main essence of nature and anthropogenic biological threats?

2. What are the destabilizing factors take into account for biological safety?

3. What are the measures for ensuring biological safety?

4. What are the characteristics of dangerous goods transportation? The main requirements to containers.

5. What are the types of program for income maintenance?

Lecture 5

1. What are the main sources of danger?

2. What is the essence of self-organization?

3. Definition of Complexity Theory and its elements

4. What is the system and system property?

5. What is the emergency? The main aspects of emergency.

Lecture 6

1. What are the age restrictions for recreation vehicle-defined?

2. What are the examples of prohibited operations for recreation vehicle-defined?

3. What are the main definitions in OSHA?

4. What is the content of «worker» definition?

5. What are the purposes of «occupational health services»?

2 ANSWERS

Find the correct answers to questions

1."Occupational health service" means a service organized in or near a workplace for the purposes of

(a) protecting workers against any health hazard that may arise out of their work or the conditions under which it is carried on,

(b) ensuring the physical and mental adjustment of workers in their employment and ensuring their assignment to jobs for which they are suited, and

(c) contributing to the establishment and maintenance of a high degree of physical and mental well-being of the workers; (« service d'hygiène »)

2. - "advisory council"

-"agency of the government"

-"chief occupational medical officer"

-"construction project"

-"construction project site"

-"contractor"

-"department"

-"director"

-"discriminatory action"

-"division"

-"employer"

-"health"

-"minister"

-"occupational health service"

-"occupational health nurse"

-"owner"

-"person"

-"physician"

-"prime contractor"

-"representative"

-"safety"

-"safety and health officer"

-"supervisor"

-"supplier"

-"union"

-"welfare"

-"worker"

-"worker safety and health representative"

-"workplace"

3. (a) any person who is employed by an employer to perform a service whether for gain or reward, or hope of gain or reward or not,

(b) any person engaged by another person to perform services, whether under a contract of employment or not

(i) who performs work or services for another person for compensation or reward on such terms and conditions that he is, in relation to that person, in a position of economic dependence upon that person more closely resembling the relationship of any employee than that of an independent contractor, and

(ii) who works or performs services in a workplace which is owned or operated by the person who engages him to perform services,

(c) any person undergoing training or serving an apprenticeship at an educational institution or at any other place; (« travailleur »)

4. The appearance of a property or feature not previously observed as a functional characteristic of the system. Generally, higher level properties are regarded as emergent. An automobile is an emergent property of its interconnected

parts. That property disappears if the parts are disassembled and just placed in a heap. There are three aspects involved here. First is the idea of 'supervenience', this means that the emergent properties will no longer exist if the lower level is removed (i.e. no 'mystically' disjoint properties are involved). Secondly the new properties are not aggregates, i.e. they are not just the predictable results of summing part properties (for example when the mass of a whole is just the mass of all the parts added together). Thirdly there should be causality - thus emergent properties are not epiphenomenal (either illusions or descriptive simplifications only). This means that the higher level properties should have causal effects on the lower level ones - called 'downward causation', e.g. an amoeba can move, causing all its constituent molecules to change their environmental positions (none of which however are themselves capable of such autonomous trajectories). This implies also that the emergent properties 'canalize' (restrict) the freedom of the parts (by changing the 'fitness landscape', i.e. by imposing boundary conditions or constraints).

5. The essence of self-organization is that system structure often appears without explicit pressure or involvement from outside the system. In other words, the constraints on form (i.e. organization) of interest to us are internal to the system, resulting from the interactions among the components and usually independent of the physical nature of those components. The organization can evolve in either time or space, maintain a stable form or show transient phenomena. General resource flows within self-organized systems are expected (dissipation), although not critical to the concept itself. The field of self-organization seeks general rules about the growth and evolution of systemic structure, the forms it might take, and finally methods that predict the future organization that will result from changes made to the underlying components. The results are expected to be applicable to all other systems exhibiting similar network characteristics.

6. Organizing dangerous goods transportation and establishing informational-technological models, it is very important that the dangerous goods were distributed according to appropriate features. This may help to gather concrete information for separate parameters of transportation process. Characteristics of dangerous goods transportation may be:

- Physical-chemical properties of transported materials;
- Running parameters of containers and packages;
- Degree of danger;
- Conditions that describes specific properties of good.

Containers may be grouped according to different aspects: according to goods unit weight, goods clearance, according to technique of loading-unloading, according to possible ways to load a transport unit, transportation and storage conditions, protection and outside influence conditions. Otherwise a united system, according to which dangerous goods may be safely transported, can't be created according to this criterion. That's way in this chapter principals of grouping dangerous goods are offered, according to which optimal criterion way be selected, which will be used to establish the probability model of car accidents and to create informational system.

7. First problem is related to dangerous growth of infectious sickness rate and worsening of demography indices. It is well known that prognosis about total liquidation by the end of 20th century of a number of socially important infections proved to be wrong. Besides growth of the so called emerging infectious diseases was fixed. Their rate outstrips the potentialities of modern medicine. The most dangerous is the group of emerging infections of virus origin against which there is no effective therapeutic remedies. What is more, the growing spectrum of pathogenic microorganisms requires extension of test systems and diverse immunobiology preparations which involves not only enormous expenses on their development, production, purchase, but also presents a problem their rational use. The second problem is connected with the unreasonable human activity, which is

fraught with dangerous proliferation of artificially modified organisms and a grown threat of biocrime.

8. We have to take into account the following destabilizing factors:

1. Worsening of ecological and sanitary-epidemiological situation;
2. Weakness of centralized state system of biosafety;
3. Lack of financing of fundamental and applied biological research;
4. Lag behind in terms of development of scientific and industrial sectors in the sphere of biosafety;

Lack of efficient provision of country's population by diagnostic preparations and medicines.

9. Taking into the motioned problems of national biological safety put on the agenda the political, organizational, legal, scientific, economical, medical, operational, informational, prognostic, educational measures.

1. Development of vertically integrated national system of biological safety.
2. Improvement of the state's legal base in the sphere of biological safety and its accordance with the international analogues.
3. Non-admission of a lag in the sphere of modern biological and biotechnological sciences.
4. The increase of education of our population in the sphere of biosafety.
5. Implementation of a scientific and industrial complex program of biosafety.
6. Development and introduction of IT technologies in the sphere of biosafety.
7. Development of modern detecting and defending methods against BW weapons.
8. Inventory of biologically dangerous objects and territories, and the introduction of passport system.

9. Development of centers of gene's resources, conservation of unique natural reservoirs in national parks.

Control over observance of international commitments in the sphere of biosafety, participation in the programs of non-proliferation of weapons of mass destruction and terrorism.

10. This policy is usually applied through various programs designed to provide a population with income at times when they are unable to care for themselves. Income maintenance is based in a combination of five main types of program:

- social insurance, considered above
- means-tested benefits. This is financial assistance provided for those who are unable to cover basic needs, such as food, clothing and housing, due to poverty or lack of income because of unemployment, sickness, disability, or caring for children. While assistance is often in the form of financial payments, those eligible for social welfare can usually access health and educational services free of charge. The amount of support is enough to cover basic needs and eligibility is often subject to a comprehensive and complex assessment of an applicant's social and financial situation. See also, Income Support.
- non-contributory benefits. Several countries have special schemes, administered with no requirement for contributions and no means test, for people in certain categories of need - for example, veterans of armed forces, people with disabilities and very old people.
- discretionary benefits. Some schemes are based on the discretion of an official, such as a social worker.

universal or categorical benefits, also known as demogrants. These are non-contributory benefits given for whole sections of the population without a test of means or need, such as family allowances or the public pension in New Zealand (known as New Zealand Superannuation). See also, Alaska Permanent Fund Dividend.

11. A system is a group of interacting parts functioning as a whole and distinguishable from its surroundings by recognizable boundaries. There are many varieties of systems, on the one hand the interactions between the parts may be fixed (e.g. an engine), at the other extreme the interactions may be unconstrained (e.g. a gas). The systems of most interest in our context are those in the middle, with a combination both of changing interactions and of fixed ones (e.g. a cell). The system function depends upon the nature and arrangement of the parts and usually changes if parts are added, removed or rearranged. The system has properties that are emergent, if they are not intrinsically found within any of the parts, and exist only at a higher level of description.

When a series of parts are connected into various configurations, the resultant system no longer solely exhibits the collective properties of the parts themselves. Instead any additional behavior attributed to the system is an example of an emergent system property. A configuration can be physical, logical or statistical, all can show unexpected features that cannot be reduced to an additive property of the individual parts. Crucial to such properties is the fact that we cannot even describe them using the language applicable to the parts, we need a new vocabulary, new terms to be invented, e.g. 'laser' to denote the functional features of the entity (e.g. coherent light producer).

12. The following are examples of prohibited operation

- Operating under the influence of drugs and alcohol.
- Operating on public ways or upon the right-of-way limits of a controlled access highway.
- Failure to come to a complete stop when crossing a public way (must yield to motor vehicle traffic). No person under 16½ years of age shall operate across a public way.
- Operating so as to endanger any person or property.

- Operating at an unreasonable, improper, and unsafe speed for existing conditions.
- Operating on land of another without permission of the owner. (Permission may be given to an individual or group).
- Operating within 150 feet of an occupied residence without permission of the owner.
- Operating on an ocean beach or sand dune in a manner so as to destroy, damage or break down any beach, dune or dune grass.
- Operating in a manner so as to harass or chase wildlife or domestic animals.
- Operating on a wetland such as a bog, marsh, or swamp so as to destroy or damage the wetland, if such area has been designated and posted as a protected wetland area.
- Operating in Wildlife Management Areas.

13.

- No person under 14 years of age shall operate a recreation vehicle, except as provided below:
- A person who is 12 or 13 years of age may operate if directly supervised by a person 18 years of age or older.
- A person, who is 10 or 11 years of age, may operate if directly supervised by a person 18 years old or older and the vehicle is operated on land upon which the operator lives.
- A person under 14 years of age may operate in a sanctioned race, rally, or organized event, which has been approved by the appropriate local authority.
- Under no circumstances, may a person operate who is less than 10 years of age.
- No person under the age of 16 and ½ years of age shall operate a recreation vehicle across a public way.

14. The main current scientific theory related to self-organization is Complexity Theory, which states:

Critically interacting components self-organize to form potentially evolving structures exhibiting a hierarchy of emergent system properties.

The elements of this definition relate to the following:

- Critically Interacting - System is information rich, neither static nor chaotic
- Components - Modularity and autonomy of part behavior implied
- Self-Organize - Attractor structure is generated by local contextual interactions
- Potentially Evolving - Environmental variation selects and mutates attractors
- Hierarchy - Multiple levels of structure and responses appear (hyperstructure)

Emergent System Properties - New features are evident which require a new vocabulary.

15. For want of this knowledge, the lives of most of the people of the world are lived in mortal peril. There is no doubt that perilous times have come upon us. Just the other day I thought that it would be valuable to make an interesting list of a few of the sources of danger that are going in our present world. These include:

- The danger of nuclear war
- Conventional warfare
- Chemical and biological warfare
- Radical revolution
- Global economic collapse
- Moral decline
- Technical failure
- Social violence

- Youth criminality.

16. The program Ingar describes contains the following elements:

- Safety audits
- Hazard reporting
- Observation
- Training and Awareness
- Specify behavior
- Positive Reinforcement
- Peer recognition
- Evaluation.

17. This situation is certainly not due to the low quality of the research carried out by experimental psychologists or neurophysiologists. On the contrary, methods have been developed and experiments planned to analyze very carefully all possible events in the organism associated with the presentation of the stimuli or selection of the reactions. In addition, tremendous efforts and huge sums of money have been invested in the development of methods for the exact physical measurement of all possible characteristics of the stimuli and the recording of all possible changes in the experimental subject.

No, the problem is certainly not here. It may be that there is a much more profound problem. Experimental work and theoretical development have consistently been based on the idea that organism and environment form two separate systems, and that mental activity is located in the organism, that it is an inner and private activity of the organism. It is this basic starting point which seems to lead up a blind alley. Could it be that this basic assumption is simply not correct?

18. Most of the dramatic changes in the history of science have appeared with changes in the basic assumptions of people about the characteristics of the world. The assumption that the earth is the center of the universe was based on common sense experience. From this assumption it follows that the planets must circulate

around the earth. Their orbits, however, look somewhat strange with the earth-centered assumption, because the planets seem to move backwards every now and then (epicycles). Thus it was necessary for the Greek astronomers to assume two kinds of physics: mechanics on the earth and mechanics in the heavens. This complicated physics was simplified when it was realised that the basic assumption had only a limited use, and was based on our earthly point of view. It was shown by men like Copernicus and Kepler that no separate heavenly physics is needed if we assume that the earth is moving with the planets and the sun is fixed. When we start with this assumption we may coherently explain many more experiential facts than when using the earlier assumption. This, however, does not change our experience of sunrises and sunsets.

19. With regard to environmental changes, outstanding importance is meanwhile to be attached to the cultural side of human evolution. The evolution both of mankind and of its environment are mutually dependent as processes of change and together they form a complete biotic system. First disorders of balance concerning the close relationship network between mankind and environment eventually developed following man's change from the biosphere to the "noosphere" created by him. In the course of the "neolithic revolution" mankind, while becoming more and more settled, began to become increasingly estranged from its ecological surroundings. Environmental problems caused by man led to climatic changes already about 8,000 years ago. So far they have caused an extraordinary climatic stability following the Ice Age. "Environmental art" i. e. an improved evolution - is required to escape an imminent "collapse" caused by pollution. Nowadays mankind is on the way to being the almost exclusive carrier of future evolution of this planet.

20. The conception of man in his relationship to the environment has probably always been problematic and controversial. In spite of the fact that man essentially changes his environment with his activity, the basic characteristic of human beings has usually been considered to be their inner life, their mental activity and consciousness. This is connected with the idea that man and nature

stand against each other: man as a thinking subject, inhabitant of culture and user of knowledge, and nature as something rudimentary and vulgar - if some beautifully colored sunsets or quietly whisper Moreover, the development of psychological theories has from ancient times been based on the idea that man and environment form two different and even opposed systems. Common sense psychology - as well as many scientific theories about human behavior – starts from the assumption that the inner world of man, his thoughts, feelings, hopes, and needs form the basis for his outer behavior which, however, is something trivial as such and eventually aims back at inner satisfaction, fulfillment of hopes and feelings of happiness. The achievements of the human spirit may be seen, of course, in outer behavior or changes in the structure of the environment: as palaces, musical notes on paper, or colors on canvas. However, it is thought that what is essential is not behavior or these products as such, but the ability of the human spirit to reproduce and enjoy the ideas of science or the beauty of art in our own inner world. The environment may mediate such possibilities, but it is seen only as a passive set of elements in contrast to the active inner life of man. Such elements may, however, be filtered, processed and refined by the human spirit. The importance of the environment cannot be neglected, but it forms only some sort of necessary and trivial background for the achievements of the human spirit.

21. Classification of risk

Risks can be classified into several categories depending on context e.g.:

- Inherent Business risks
- Incidental risks
- Pure and speculative risks
- Particular and fundamental risks
- Insurable and uninsurable risks.

22. Moral hazard relates to attitudes and behavior of people especially the propensity of individuals to alter their behavior because they are insured.

There are 2 types of moral hazard:

Ex ante moral hazard. Relates to the effect insurance can have on the insured's incentive to prevent losses e.g. does a person who has motor insurance drive less carefully than a person without insurance?

Ex post moral hazard. This relates to the effect insurance can have on the insured's incentive to mitigate the extent of a loss that has already occurred e.g. does the existence of insurance remove the incentive on the part of the insured to take more bold steps to put out a fire than would otherwise be the case if the person had no insurance?

23. Limitations of insurance

- Unavailability of cover for uninsurable risks.
- Contracts are not tailor-made to the specific needs of individual clients.
- Insurance contracts tend to be classical with much emphasis placed on terms, conditions, exceptions etc. This makes insurance complex for the layman to understand.
- Limited capacity of insurers often leaves clients inadequately covered.

Premiums are often dictated by other factors that may have no direct bearing on the insured.

Market failure in insurance

In a perfectly competitive market government intervention will only be desirable where:

- Actual or potential market failures exist.
- The market failures could lead to inefficiency or inequity.
- Government action can ameliorate the inefficiency or inequity.

Thus if at least one of the 3 conditions above is not met government intervention is not warranted. What are the causes of market failure in insurance?

- Specialized (unique) risks that cannot be pooled.
- Adverse selection arising from information asymmetries.
- Public goods-where risk reduction initiatives by X confers benefits on Y then there is no incentive for X to manage the risk in question.

- Inadequate compensation. A market for risk takers can only thrive if the returns for taking the risk justify the investment.
- Market power

24. Definitions of risk

No universal definition exists. Sometimes the meaning of word "risk" varies depending on context e.g. it is commonly used in insurance to refer to insured items like cars, buildings etc. Risk has also been defined as:

- A combination of hazards measured by probability.
- A condition in which losses are possible.
- Uncertainty of loss.

Statisticians and economists associate risk with variability. From this we define risk to mean the variation of actual outcomes from expected outcomes e.g. in an investment decision-Expected outcome = profit; actual outcome=loss hence risk.

25. Modern societies, however, are exposed to risks such as pollution, newly discovered illnesses, crime, that are the result of the modernization process itself. Gidden defines these two types of risks as external risks and manufactured risks. Manufactured risks are marked by a high level of human agency involved in both producing, and mitigating such risks.

As manufactured risks are the product of human activity, authors like Giddens and Beck argue that it is possible for societies to assess the level of risk that is being produced, or that is about to be produced. In turn, this sort of reflexive introspection can in turn alter the planned activities themselves. As an example, disasters such as Chernobyl and the Love Canal Crisis, public faith in the modern project has declined (a claim that has not been independently verified within all population groups) leaving public distrust in industry, government and experts. In turn, social concerns have led to the increased regulation of the nuclear power industry and to the abandoning of some expansion plans, altering the course of modernization itself. This increased critique of modern industrial

practices is said to have resulted in a state of reflexive modernization, illustrated by concepts such as sustainability and the precautionary principle that focus on preventative measures to decrease levels of risk.

26. General duties of employers to employees

1. It shall be the general duty of every employer to ensure, as far as is reasonably practicable, the health, safety and welfare at work of all of his employees.

Section 3: General duties of employers and self-employed to persons other than their employees

It shall be the duty of every employer to conduct his undertaking in such a way as to ensure, so far as is reasonably practicable, that persons not in his employment who may be affected thereby are not thereby exposed to risks to their health and safety.

27. We propose a new concept, called health-related safety in the home and community, which is defined as the minimization of the probability of preventable, unintended harm in community-dwelling individuals. Health-related safety aims to understand how and why adverse health events occur and to identify what breakdowns in the societal system expose individuals to hazards. Subsequently, effective multilevel interventions can be developed to systematically manage or remove the root causes of harm.

28. In 1976 in Italy, at a place called Seveso, there was an explosion at a chemical factory manufacturing pesticides. This released a cloud of 2,4,5-trichlorophenol that also contained 3,4,8,9-tetrachlorodibenzo-1,4-dioxin, which is highly toxic. A number of children exposed to these chemicals suffered from chloracne, and were hospitalised, and about 3000 farm animals died. As a result of this incident the European Union later introduced the Seveso Directive in an effort to prevent accidents in large chemical factories.

In 1984, the worst ever chemical factory disaster occurred in Bhopal, India: 45 tonnes of methyl isocyanate ($CH_3N=C=O$) gas escaped from two underground storage tanks at a Union Carbide pesticide plant. This highly toxic gas resulted in the deaths of 6000 people, 300 000 were injured and 7000 animals also died.

29. The Health and Safety at Work etc. Act (HSWA) 1974 states that:

- It is the duty of every employer, so far as is reasonably practicable, to ensure the health, safety and welfare at work of all employees (this includes students).
- It is the duty of every employee while at work to take reasonable care of himself (herself) and of other persons who may be affected by his (her) acts or omissions at work.

The employees must cooperate with the employer with regard to health and safety procedures.

30. Current health and social service organizations offer a variety of assistance to community-dwelling elders to age in place in a healthy and safe manner; however, many services are limited in scope, geography, or eligibility. At the national policy level, public programs include those funded through Medicare and Medicaid

The Program of All-Inclusive Care for the Elderly (PACE), considered the most comprehensive public program, coordinates health care, nutritional, social, and transportation services to older adults. Offered in local communities of 18 states, PACE leaves large areas without services

At the community service level, there are fee-for-service geriatric case-management agencies that offer a variety of medical and social services, but many are prohibitively expensive. Other community-based geriatric health and safety interventions are offered only at the point of medical service, such as in the emergency department (Aminzadeh & Dalziel, 2002; Gerson, Rousseau, Hogan, Bernstein, & Kalbfleisch, 1995) or at the outpatient and inpatient settings (Kuo, Scandrett, Dave, & Mitchell, 2004).

To address the quality of health care services specifically for chronic medical conditions, Wagner and colleagues developed the chronic care model (CCM; Wagner, Davis, Schaefer, Von Korff, & Austin, 1999), which describes improvements to practices in primary care settings for patients with chronic illness.

Conclusions

The methodical indications are developed for the foreign students, whom learning subject «Safety of living» in English.

Also, the methodical indications are aimed for more deep learning of the lecture material with help of the self-control method.

The questions and answers, which drived in these methodical indications, are at the limits of the lecture material only.

LIST OF RECOMMENDED LITERATURE

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Методичні вказівки

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